What is claimed is:

1. A method for determining the distribution volume of a blood component in the body of an organism during an extracorporeal blood treatment, in which the blood to be treated flows in an extracorporeal circuit through the blood chamber of a dialyzer subdivided by a semipermeable membrane into the blood chamber and a dialyzing-fluid chamber, and dialyzing fluid flows in a dialyzing-fluid path through the dialyzing-fluid chamber of the dialyzer, comprising the following method steps:

bringing about a change in the concentration of a blood component in the blood upstream of the dialyzer by a change in a physical or chemical characteristic in the dialyzing fluid upstream of the dialyzer; and

measuring the change in the physical or chemical characteristic in the dialyzing fluid downstream of the dialyzer which can be attributed to the change in the concentration of the blood component in the blood; and

determining the distribution volume V of the blood component from the change in the physical or chemical characteristic in the dialyzing fluid upstream and downstream of the dialyzer.

2. A method for determining the distribution volume of a blood component in the body of an organism during an extracorporeal blood treatment, in which the blood to be treated flows in an extracorporeal circuit through the blood chamber of a dialyzer subdivided by a semipermeable membrane into the blood chamber and a dialyzing-fluid

chamber, and dialyzing fluid flows in a dialyzing-fluid path through the dialyzing-fluid chamber of the dialyzer, comprising the following method steps:

- a physical or chemical characteristic of the dialyzing fluid is altered in the dialyzing-fluid path upstream of the dialyzer, and the physical or chemical characteristic of the dialyzing fluid is measured downstream of the dialyzer;

- the change as a function of time in the concentration of a blood component in the blood upstream of the dialyzer Δcbi is determined from the physical or chemical characteristic of the dialyzing fluid upstream and downstream of the dialyzer; and

- the distribution volume V of the blood component is determined from the change as a function of time in the concentration of a blood component in the blood.

3. The method as recited in Claim 1 or 2, wherein the physical or chemical characteristic of the dialyzing fluid in the dialyzing-fluid path is measured upstream of the dialyzer.

4. The method as recited in one of Claims 1 through 3, wherein the physical or chemical characteristic of the dialyzing fluid upstream and downstream, respectively, of the dialyzer is the substance concentration in the dialyzing fluid upstream of the dialyzer (dialyzing-fluid input concentration cdi) and downstream of the dialyzer (dialyzing-fluid output concentration cdo).

5. The method as recited in Claim 4, wherein the conductivity of the dialyzing fluid is

measured as the physical or chemical characteristic for determining the distribution volume of sodium in the blood.

6. The method as recited in Claim 5,
wherein the sodium distribution volume is ascertained for determining the distribution volume of urea in the blood, and the urea distribution volume is determined from the sodium distribution volume.

7. The method as recited in Claim 6,
wherein the urea distribution volume is determined under the assumption that the sodium distribution volume essentially corresponds to the urea distribution volume.

8. The method as recited in one of Claims 1 through 7,
wherein the physical or chemical characteristic of the dialyzing fluid in the dialyzing-fluid path is increased at a point of time t_0 from a predetermined first value cdi_0 to a predetermined second value cdi_1, is reduced at a point of time $t_1 > t_0$ to a predetermined third value cdi_2, and is increased at a point of time $t_2 > t_1$ to a predetermined fourth value cdi_0 which is equal to the first value, the value by which the characteristic is increased being half as large as the value by which the characteristic is reduced.

9. The method as recited in Claim 8,
wherein the time interval $t_1 - t_0$ is equal to the time interval $t_2 - t_1$.

10. The method as recited in Claim 8 or 9,
wherein the change as a function of time in the concentration of a blood component in the blood upstream of the dialyzer Δcbi is ascertained from:

the predetermined first value cdi_0 of the physical or chemical characteristic of the dialyzing fluid upstream of the dialyzer and the value cdo_0 of the characteristic that ensues downstream of the dialyzer, and the predetermined second value cdi_1 of the characteristic upstream of the dialyzer and the value cdo_1 of the characteristic which ensues downstream of the dialyzer after the increase in the characteristic upstream of the dialyzer to the predetermined second value, and the predetermined third value cdi_2 of the characteristic upstream of the dialyzer and the value cdo_2 of the characteristic which ensues downstream of the dialyzer after the decrease in the characteristic upstream of the dialyzer to the predetermined third value.

11. The method as recited in Claim 10, wherein the dialyzing fluid is balanced such that the volume of the dialyzing fluid flowing into the dialyzer during the measurement is equal to the volume of the dialyzing fluid flowing out of the dialyzer.

12. An apparatus for determining the distribution volume of a blood component in the body of an organism during an extracorporeal blood treatment in conjunction with an extracorporeal blood-treatment device, in which the blood to be treated flows in an extracorporeal circuit through the blood chamber (3) of a dialyzer (1) subdivided by a semipermeable membrane (2) into the blood chamber and a dialyzing-fluid chamber (4), and dialyzing fluid flows in a dialyzing-fluid path through the dialyzing-fluid chamber of the dialyzer, having

a device (17) for altering the physical or chemical characteristic of the dialyzing fluid in the dialyzing-fluid path upstream of the dialyzer, **[and]**

a measuring device (24) for determining the physical or chemical characteristic of the dialyzing fluid in the dialyzing-fluid path downstream of the dialyzer,

characterized by an arithmetic and evaluation unit (29) which is designed in such a way that the distribution volume V of the blood component can be determined from a change in the physical or chemical characteristic in the dialyzing fluid downstream of the dialyzer which can be attributed to the change in the concentration of a blood component in the blood because of a change in the physical or chemical characteristic in the dialyzing fluid upstream of the dialyzer.

13. An apparatus for determining the distribution volume of a blood component in the body of an organism during an extracorporeal blood treatment in conjunction with an extracorporeal blood-treatment device, in which the blood to be treated flows in an extracorporeal circuit through the blood chamber (3) of a dialyzer (1) subdivided by a semipermeable membrane (2) into the blood chamber and a dialyzing-fluid chamber (4), and dialyzing fluid flows in a dialyzing-fluid path through the dialyzing-fluid chamber of the dialyzer, having

a device (17) for altering the physical or chemical characteristic of the dialyzing fluid in the dialyzing-fluid path upstream of the dialyzer, **[and]**

a measuring device (24) for determining the physical or chemical characteristic of the dialyzing fluid in the dialyzing-fluid path downstream of the dialyzer,

characterized by an arithmetic and evaluation unit (29) which is designed in such a way that the change as a

function of time in the concentration of the blood component Δcbi in the blood upstream of the dialyzer can be determined from the physical or chemical characteristic of the dialyzing fluid upstream and downstream of the dialyzer, and the distribution volume V of the blood component can be determined from the change as a function of time in the concentration of the blood component upstream of the dialyzer.

14. The apparatus as recited in Claim 12 or 13, wherein a measuring device (23) is provided for detecting the physical or chemical characteristic of the dialyzing fluid in the dialyzing-fluid path upstream of the dialyzer (1).

15. The apparatus as recited in one of Claims 12 through 14, wherein the device (17) for altering the physical or chemical characteristic is designed as a device for altering the substance concentration of the dialyzing fluid upstream of the dialyzer (dialyzing-fluid input concentration cdi).

16. The apparatus as recited in one of Claims 12 through 15, wherein the measuring devices (23,24) for detecting the physical or chemical characteristic are designed as measuring devices for detecting the substance concentration of the dialyzing fluid downstream and upstream, respectively, of the dialyzer (dialyzing-fluid output concentration cdo and input concentration cdi).

17. The apparatus as recited in Claim 16, wherein the first and second measuring devices (23,24) for detecting the physical or chemical characteristic

have a conductivity sensor, optical sensor or enzyme sensor arranged in the dialyzing-fluid path downstream and upstream, respectively, of the dialyzer.

18. The apparatus as recited in one of Claims 12 through 17,
wherein the device (17) for altering the physical or chemical characteristic is designed in such a way that the characteristic is increased at a point of time t_0 from a predetermined first value cdi_0 to a predetermined second value cdi_1, is reduced at a point of time $t_1 > t_0$ to a predetermined third value cdi_2, and is increased at a point of time $t_2 > t_1$ to a predetermined fourth value cdi_0 which is equal to the first value, the value by which the characteristic is increased being half as large as the value by which the characteristic is reduced.

19. The apparatus as recited in Claim 18,
wherein the time interval $t_1 - t_0$ is equal to the time interval $t_2 - t_1$.

20. The apparatus as recited in Claim 18 or 19,
wherein the arithmetic and evaluation unit (29) is designed in such a way that the predetermined first, second and third values cdi_0, cdi_1, cdi_2 of the physical or chemical characteristic of the dialyzing fluid upstream of the dialyzer (1) and the values cdo_0, cdo_1, cdo_2 of the physical or chemical characteristic of the dialyzing fluid ensuing downstream of the dialyzer are evaluable for determining the change as a function of time in the concentration of the blood component Δcbi.

21. The apparatus as recited in one of Claims 12 through 20,
wherein a balancing device (10) is provided with which

the dialyzing fluid can be balanced in such a way that the volume of the dialyzing fluid flowing into the dialyzer (1) during the measurement is equal to the volume of the dialyzing fluid flowing out of the dialyzer.